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APPLICANT : NIPPON STEEL CORP;

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$0.5884 \times 10^{-4} \leq W_{17/50} \leq 0.7558 \times 10^{-4}$

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TITLE : GRAIN-ORIENTED SILICON STEEL
SHEET AND ITS PRODUCTION

ABSTRACT : PROBLEM TO BE SOLVED: To produce a grain-oriented silicon steel sheet showing an excellent core loss specified curve by a simple process by specifying the contents of Si, Mn and acid insoluble Al and specifying the relation between the sheet thickness and average grain size.

SOLUTION: This silicon steel sheet is composed of, by weight, 2.5 to 4.0% Si, 0.02 to 0.20% Mn, 0.005 to 0.050% acid insoluble Al, and the balance Fe with inevitable impurities. In the case of 0.20 to 0.55mm sheet thickness, the average grain size is 1.5 to 5.5mm, and $W_{17/50}$ satisfies the range shown by the inequality. In this way, a grain-oriented silicon steel sheet having magnetic flux density of $1.80 \leq B_8 \leq 1.88T$ can be obtd. The silicon steel sheet can be obtd. by subjecting a coil obtd. by heating a slab having the compsn. and thereafter executing rolling to direct hot rolled sheet annealing at $\leq 1100^\circ C$ and executing finish cold rolling, decarburizing annealing, application of a separation agent for annealing and finish annealing. Preferably, the content of C in the steel is regulated to 0.02 to 0.15%, and one or two kinds of S and Se are incorporated therein by 0.005 to 0.040%.

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